

IN THE SPECIFICATION:

Page 4, delete paragraph [0012] in its entirety.

Page 5, line 17 ,delete "[0013]"

Page 5, in the paragraph beginning at line 18:

[[[2)]] (1) A communication control system for controlling communications performed between a plurality of communication stations that are connected to communication paths being multiplexed with a main path and a sub-path, the communication control system comprising:

Page 6, in the paragraph beginning at line 8:

a high-priority communication section for performing a high-priority communication via the first communication function implementing section and the second communication function implementing section each corresponding to any one of the multiplexed communication paths; and

Page 6, in the paragraph beginning at line 13:

a low-priority communication section for performing a low-priority communication via the first communication function implementing section and the second communication function implementing section each corresponding to the sub-path,

Page 6, in the paragraph beginning at line 15:

wherein the high-priority communication section and the low-priority communication section coexist in a single communication station, and

Page 6, after the paragraph beginning at line 15, insert the following:

the second communication function implementing section includes:

an address storing section for storing MAC addresses corresponding to the high-priority communication section and the low-priority communication section respectively;

a transmitting section which attaches the corresponding MAC address to a communication frame depending on whether a transmission requestor is the high-priority communication section or the low-priority communication section, and transmits the communication frame to the communication path; and

a receiving section which compares a destination MAC address of a communication frame received from the first communication function implementing section with the MAC address stored in the address storing section, and when a match is found in the

comparison result, sends the received communication frame to the corresponding communication section.

Page 6, delete paragraph [0014] in its entirety.

Page 7, line 13:

[004513]

Page 7, in the paragraph beginning at line 14:

(42) The communication control system according to (21) ~~or (3)~~, further comprising:

Page 8, line 2:

[004614]

Page 8, in the paragraph beginning at line 3:

(53) The communication control system according to ~~any one of (1) to or~~ ([4]12), wherein units each including the high-priority communication section, the low-priority

communication section and the communication function implementing sections, or units each including the high-priority communication section, the low-priority communication section, the first communication function implementing sections and the second communication function implementing sections are provided and multiplexed in a single communication station, and

Page 8, line 15:

[004715]

Page 8, in the paragraph beginning at line 16:

(~~64~~) A communication control system for controlling communications performed between a plurality of communication stations that are connected to communication paths being multiplexed with a main path and a sub-path, the communication control system comprising:

Page 9, in the paragraph beginning at line 2:

a switching section for switching the communication path of the high-priority communication to the sub-path when the main path is diagnosed as faulty as a result of diagnosis by the path diagnosing section[~~[.]~~],

Page 8, after the paragraph beginning at line 5, insert the following:

wherein the path diagnosing section includes:

\_\_\_\_\_ a path state storing section for storing path state information of a path state from a home station to each communication station; and

\_\_\_\_\_ a fixed-cycle path diagnosing section for diagnosing the communication path from the home station to each communication station in a fixed cycle,

\_\_\_\_\_ wherein the fixed-cycle path diagnosing section registers the path state information obtained from the diagnosis result, in the path state storing section,

\_\_\_\_\_ the fixed-cycle path diagnosing section broadcasts a path diagnosis packet in accordance with a multicast protocol of Internet Protocol,

\_\_\_\_\_ different IP multicast addresses are assigned to the main path and the sub-path respectively, and

\_\_\_\_\_ each communication station performs broadcasting by using the IP multicast address corresponding to a path selected between the main path and the sub-path, as a destination IP address, and receives a path diagnosis packet of which destination IP address matches with the IP multicast address corresponding to each of the main path and the sub-path.

Page 9, line 6, delete paragraph [0018] in its entirety.

Page 9, line 18:

[004916]

Page 9, in the paragraph beginning at line 19:

(((8)]5) The communication control system according to (((7)]4), wherein the fixed-cycle path diagnosing section includes a diagnosis packet transmitting section for broadcasting to other communication stations a path diagnosis packet including receive state information of path diagnosis packets from other communication stations, and

Page 10, line 7, delete paragraph [0020] in its entirety.

Page 10, line 20, delete paragraph [0021] in its entirety.

Page 11, line 18, delete paragraph [0023] in its entirety.

Page 12, line 2:

[002417]

Page 12, in the paragraph beginning at line 3:

(([[13]]6) The communication control system according to [[any one of]] (([[6]]4) [[to]]or  
(([[12]]5), further comprising:

Page 12, line 19:

[002518]

Page 12, in the paragraph beginning at line 20:

(([[14]]7) The communication control system according to (([[13]]6), wherein the  
multiplexed communication station each includes a self diagnosing section,

Page 13, line 12:

[002619]

Page 13, in the paragraph beginning at line 13:

(~~[[15]]~~8) The communication control system according to (~~[[6]]~~4), wherein while the path diagnosing section detects a failure in the main path, the path diagnosing section broadcasts the failure in the main path to all communication stations in a fixed cycle.

Page 13, line 18:

~~[002720]~~

Page 13, in the paragraph beginning at line 19:

(~~[[16]]~~9) The communication control system according to (15), wherein when the low-priority communication section receives a broadcast notice indicating that the main path is faulty, the low-priority communication section controls a transmission so that a transmission count per unit time of low-priority communication is equal to or smaller than a predetermined value,

Page 14, line 2:



[002821]

Page 14, in the paragraph beginning at line 8:

(((17))10) The communication control system according to (((6))4), wherein while the low-priority communication section recognizes the main path as faulty, the low-priority communication section controls a transmission so that a transmission count per unit time of the low-priority communication is equal to or smaller than a predetermined value.

Page 14, line 15:

[002922]

Page 14, in the paragraph beginning at line 16:

(((18))11) The communication control system according to [[any one of]] (((6))4) [[to (17)]]], wherein in a case where the low-priority communication section is recognizing the main path as faulty, while the sub-path is not under transmission, the low-priority communication section immediately performs the high-priority communication, and while the sub-path is not under transmission and there is no high-priority communication waiting

to be transmitted, the low-priority communication section performs the low-priority communication.

Page 14, line 25:

[003023]

Page 15, in the paragraph beginning at line 1:

([[19]]12) The communication control system according to ([[6]]4), further comprising:

Page 15, line 7:

[003124]

Page 15, in the paragraph beginning at line 8:

([[20]]13) The communication control system according to ([[19]]2), wherein the authentication section includes:

Page 16, in the paragraph beginning at line 3:

an authentication packet receiving section which performs at least either  
[[decoding]] decrypting of the received packet by using the common key or determination  
on whether reception is allowed based on the common key and the authentication value  
being attached to the packet.

Page 16, line 8:

[003225]

Page 16, in the paragraph beginning at line 9:

([[21]]14) The communication control system according to ([[20]]13), wherein the  
common key generating section generates the common key from the private key and the  
public key by using Differ-Hellman method.

Page 16, line 13:

[003326]

Page 16, in the paragraph beginning at line 14:

(((22))15) The communication control system according to (((20))13), [[further comprising]] wherein the authentication section includes:

Page 17, line 3:

[003427]

Page 17, in the paragraph beginning at line 4:

(((23))16) The communication control system according to [[anyone of]] (1) [[to]] or (((22))4), wherein a router for performing a path control of the communication path in accordance with Internet Protocol is provided on the communication path, and the communication path includes a plurality of sub-networks being interconnected by the router.

Page 17, line 10:

[003528]

Page 17, in the paragraph beginning at line 11:

(((24)]17) The communication control system according to (((23)]16), wherein a sole master station exists on the sub-network,

Page 18, line 11:

[003629]

Page 18, in the paragraph beginning at line 12:

(((25)]18) The communication control system according to (((23) or (24)]17), further comprising:

Page 18, line 20:

[003730]

Page 18, in the paragraph beginning at line 21:

(~~[[26]]~~19) The communication control system according ~~[[to any one of]]~~ (1) ~~[[to]]~~or  
(~~[[25]]~~4), wherein the high-priority communication section performs communication in  
accordance with a protocol dedicated to process control, and

Page 19, line 2:

~~[0038]~~31

Page 19, in the paragraph beginning at line 3:

(~~[[27]]~~20) The communication control system according to ~~[[any one of]]~~ (1) ~~[[to]]~~or  
(~~[[26]]~~4), wherein the high-priority communication section transfers at least one of process  
data, an operation amount and an alarm, and

Page 18, after the paragraph beginning at line 9, insert the following:

[0032]

(21) A communication control system for controlling communications performed between a plurality of communication stations that are connected to communication paths being multiplexed with a main path and a sub-path, the communication control system comprising:

\_\_\_\_\_ a high-priority communication section for performing a high-priority communication normally via the main path;

\_\_\_\_\_ a low-priority communication section for performing a low-priority communication via the sub-path;

\_\_\_\_\_ a path diagnosing section for diagnosing a soundness of the main path and the sub-path; and

\_\_\_\_\_ a switching section for switching the communication path of the high-priority communication to the sub-path when the main path is diagnosed as faulty as a result of diagnosis by the path diagnosing section.

[0033]

(22) The communication control system according to (21), wherein the path diagnosing section includes:

\_\_\_\_\_ a path state storing section for storing path state information of a path state from a home station to each communication station; and

\_\_\_\_\_ a fixed-cycle path diagnosing section for diagnosing the communication path from the home station to each communication station in a fixed cycle,

\_\_\_\_\_ wherein the fixed-cycle path diagnosing section registers the path state information obtained from the diagnosis result, in the path state storing section.

[0034]

(23) The communication control system according to (22), wherein the fixed-cycle path diagnosing section includes a diagnosis packet transmitting section for broadcasting to other communication stations a path diagnosis packet including receive state information of path diagnosis packets from other communication stations, and  
on receiving a path diagnosis packet, the fixed-cycle path diagnosing section registers in the path state storing section receive state information of the path diagnosis packet transmitted by the home station, the receive state information being included in the received path diagnosis packet, as the path state information of the communication path from the home station to a transmitting source of the path diagnosis packet.

[0035]

(24) The communication control system according to any one of (21) to (23), further comprising:  
a data transmitting section which transmits data to another communication station, and retransmits the data when a normal reception response is not returned from the another communication station within a predetermined time; and  
a data receiving section for returning a normal reception response to a transmitting source when data is normally received.

[0036]

(25) The communication control system according to (24), further comprising:  
a path state storing section for storing path state information of a path state from a home station to each communication station;  
a counting section for counting times of the data transmitting section retransmitting the data;  
and



a registering section which, when a count value of the counting section reaches a specified value, determines the communication path as faulty and registers the path state information indicating that the path is faulty, in the path state storing section.

[0037]

(26) The communication control system according to (24), further comprising:

a counting section for counting times of the data transmitting section retransmitting the data;  
and

a switching section which, when a count value of the counting section reaches a specified value, determines the communication path as faulty and switches the communication path.

Page 30, in paragraph [0056] beginning at line 14:

The path diagnosing section 403, on determining that the main path 11 is [[normal]] faulty, broadcasts the fault in the main path to all communication stations. The low-priority communication section 402, on receiving the broadcast notice that the main path is faulty, controls transmissions so that the transmission count per unit time of low-priority communications will drop below a predetermined value. When the broadcast notice that the main path is faulty is not received for a predetermined time, the low-priority communication section 402 determines that the main path is restored to normal operation

and halts the transmission control whereby the transmission count is kept below the predetermined value.

Page 32, in paragraph beginning at line 22:

The transmitting section 502, in case a normal reception response is not received within a predetermined period of time after data transmission, assumes the communication path as faulty and reflects this information on the path state information in the path state storing section 501.

Page 33, in paragraph beginning at line 2:

The receiving section 503 receives data from the distant station and passes the received data to the high-priority communication section 401. When receiving data from the distant communication [[state]] station, the receiving section 503 returns a normal reception response to the distant communication station.

Page 33, in the paragraph beginning at line 17:

The fixed cycle path diagnosing section 504 includes diagnosis packet transmitting section 505 (not shown). The diagnosis packet transmitting section 505 broadcasts a path diagnosis packet including the information on the receiving state of a path diagnosis packet from another communication station to the other stations.

Page 41, in paragraph beginning at line 11:

Authentication packet receiving section 805 ~~[[encrypts]]~~ decrypts a packet received from the other communication station 81 by using the common key K3 or determines whether reception is allowed based on the common key and the authentication value attached to the packet.

Page 41, in the paragraph beginning at line 17:

Key update section ~~[[805]]~~808 updates a private key for every predetermined time to update a common key.

Page 43, in the paragraph beginning at line 11:

In the communication station 81, authentication packet ~~[[transmitting]]~~ receiving section 805 ~~[[encrypts]]~~ decrypts a packet received from the communication station 80 by using the common key K3' or determines whether reception is allowed based on the common key K3' and the authentication value attached to the packet.

Page 45, in the paragraph beginning at line 4:

Diagnosing message receiving section 222 registers in the path state storing section 221 the path state between the home station and a communication station present on a sub-network to which the home station does not belong based on the path state information included in the inter-network diagnosing frame. In the example shown in Fig. ~~[[20]]~~ 12, the diagnosing message receiving section 222 registers the path state between the communication station 20 and a communication station on the sub-network 11b, 12b.

Page 45, in the paragraph beginning at line 21:

Selecting section 224 ~~[[preparing]]~~ prepares a list of the network addresses of all communication stations present on a sub-network and, in case the address of the home station is one uniquely determined from predetermined conditions, causes the home station to operate as the master station on the sub-network. The address uniquely determined refers to, for example, the highest address, the lowest address, and the like.